

WHAT IS CLAIMED IS:

- 1 1. A vertical lift system for transporting a receptacle (3) from one deck to another deck, particularly in a passenger aircraft, said vertical lift system comprising a vertical lift (71), a number of gripper mechanisms (7) secured to said vertical lift (71) for gripping said receptacle, a number of latch elements (9) secured to said receptacle (3) in positions for engagement with said gripper mechanisms (7), each gripper mechanism (7) comprising a lifting hook (10) for engaging a respective latch element (9) of said latch elements (9), and a locking pawl (11) for locking said lifting hook in a latch element engaging position, and a mechanical coupling operatively interposed between said lifting hook (10) and said locking pawl (11) for coupling said locking pawl (11) and said lifting hook (10) with each other for holding said lifting hook (10) in a latched position against forces tending to unhook said lifting hook (10) when said vertical lift (71) moves said receptacle (3), wherein said lifting hook (10) holds said receptacle (3) against horizontal forces, and wherein said locking pawl (11) holds said receptacle (3) against vertical forces.
- 2 2. The vertical lift system of claim 1, wherein said latch elements (9) are secured to side walls of said receptacle (3) at upper corner or edge areas of said receptacle.

1 3. The vertical lift system of claim 1, wherein said latch
2 elements (9) are recessed in upper corner or edge areas of
3 side walls of said receptacle (3).

1 4. The vertical lift system of claim 1, wherein said locking
2 pawl (11) comprises a cam track (113), wherein said
3 vertical lift system comprises a stationary activating
4 member (12) mounted in a fixed position for engaging said
5 cam track (113) of said locking pawl when said vertical
6 lift is reaching an unlocking position, whereby said cam
7 track (113) engages said stationary activating member (12)
8 thereby moving along said stationary activating member
9 (12), said locking pawl (11) comprising a latching arm
10 (111) engaging an upper edge portion (31A) of said
11 receptacle (3) when said cam track (113) is disengaged from
12 said stationary activating member (12), and wherein said
13 latching arm (111) is disengaged from said upper edge
14 portion (31A) when said cam track (113) engages said
15 stationary activating member (12) for preparing a release
16 of said lifting hook (10).

1 5. The vertical lift system of claim 1, further comprising a
2 stationary guide member (115) mounted in a position for
3 guiding said locking pawl (11) when said vertical lift is
4 moving, said stationary guide member (115) holding said
5 locking pawl (11) in a locked position when said vertical
6 lift is moving.

1 6. The vertical lift system of claim 1, wherein said
2 mechanical coupling comprises an entraining element (101)
3 on said lifting hook (10) and a contact arm (114) on said
4 locking pawl (11) for engaging said entraining element
5 (101) when said locking pawl (11) is moved into a position
6 for disengaging said lifting hook (10) from its latch
7 element (9) of said latch elements.

1 7. The vertical lift system of claim 6, wherein said
2 entraining element (101) is part of said lifting hook (10)
3 and wherein said contact arm (114) is part of said locking
4 pawl (11), said lift system further comprising a stationary
5 activating member (12) for activating said locking pawl
6 (11) to engage said contact arm (114) of said locking pawl
7 (11) with said entraining element (101) of said lifting
8 hook (10) for disengaging said lifting hook (10) from said
9 respective latch (9).

1 8. The vertical lift system of claim 1, further comprising a
2 first biasing reset (141) operatively connected to said
3 locking pawl (11) and a second biasing reset (142)
4 operatively connected to said lifting hook (10), said first
5 and second biasing resets (141, 142) normally biasing said
6 locking pawl (11) and said lifting hook (10) with a biasing
7 force into a receptacle engaging position, said vertical
8 lift further comprising a stationary activating member (12)
9 positioned for disengaging said locking pawl (11) from said
10 lifting hook (10) when said receptacle is to be released

11 from said gripper mechanisms (7), against said biasing
12 force.

1 9. The vertical lift system of claim 8, wherein said first and
2 second biasing resets (141, 142) comprise springs for
3 exerting said biasing force.

1 10. The vertical lift system of claim 1, wherein each latch
2 element of said latch elements (9) comprises a hook
3 engagement guide ramp (93) and a latch recess (92) below
4 said hook engagement guide ramp (93), and wherein each
5 lifting hook (10) has a claw (103) at its free hook end,
6 said claw (103) having a claw tip for engaging said latch
7 recess (22), whereby a downward motion of said vertical
8 lift (71) causes said claw (103) to ride down along said
9 hook engagement guide ramp (93), said system further
10 comprising a biasing member (142) effective on said lifting
11 hook (10) for keeping said claw (103) engaged with said
12 hook engagement guide ramp (93) when said claw is riding
13 along said hook engagement guide ramp (93) and for biasing
14 said claw (103) of said lifting hook (10) into engagement
15 with said latch recess (92) of said latch element (9) when
16 said claw (103) slides off said hook engagement guide ramp
17 (93).

1 11. The vertical lift system of claim 1, wherein each of said
2 latch elements (9) comprises a latch recess (92) and a hook
3 disengagement guide ramp (91) below said latch recess (92),

4 and wherein each lifting hook (10) has a claw (103) at its
5 free hook end, said claw (103) riding along said hook
6 disengagement guide ramp (91) in response to a further
7 downward motion of said vertical lift (71) following a hook
8 and latch engagement, for disengaging said lifting hook
9 (10) from its latch element (9), said system further
10 comprising a stationary activating member (12) for rotating
11 said lifting hook (10) with its claw (103) out of said
12 latch engagement against a biasing force (141).

1 12. The vertical lift system of claim 1, further comprising an
2 indicator (I, P) for showing vertical positions of at least
3 one of said gripper mechanisms relative to a fixed
4 scale (I).

1 13. The vertical lift system of claim 1, wherein said
2 receptacle (3) comprises an upwardly facing edge portion
3 (31A), wherein said locking pawl (11) comprises a
4 downwardly facing arm (111) having a free end (11A) for
5 engaging said upwardly facing edge portion (31A) when said
6 receptacle is latched to said gripper mechanism (7),
7 wherein each latch element (9) has a recess (92) with a
8 downwardly facing surface, and wherein said lifting hook
9 (10) has a claw (103) with an upwardly facing surface for
10 engaging said downwardly facing surface of said recess (92)
11 when said receptacle (3) is latched to said gripper
12 mechanism, whereby a receptacle edge is clamped between
13 said free end (11A) and said claw (103).

1 **14.** The vertical lift system of claim 13, wherein said upwardly
2 facing edge portion (31A) is attached to one side of a
3 corner of said receptacle (3) and wherein said latch
4 element (9) is attached to the other side of the same
5 corner of said receptacle (3).